

What is claimed is:

1. A focus detecting optical system detecting a focus position of a photographing optical system from a positional relationship between at least one pair of secondary object images, wherein the focus detecting optical system comprises:

a condenser lens placed in the proximity of a preset imaging plane equivalent to an imaging plane of a photographic lens;

a pair of aperture stops dividing a pupil of the photographic lens placed on an exit side of the condenser lens into two areas; and

a pair of re-imaging lenses for forming two secondary object images corresponding to the aperture stops,

and satisfies the following conditions:

$$0.45 < |mg| < 0.75$$

$$0.75 < |R1 / R2| < 1.25$$

$$|R3 / R4| \leq 0.02$$

where mg is an imaging magnification of the focus detecting optical system, $R1$ is a radius of curvature of an entrance surface of the condenser lens, $R2$ is a radius of curvature of an exit surface of the condenser lens, $R3$ is a radius of curvature of an entrance surface of each of the re-imaging lenses, and $R4$ is a radius of curvature of an exit surface of each of the re-imaging lenses.

2. A focus detecting optical system according to claim 1, further comprising a light receiving element having a light-receiving surface, and satisfying the following condition:

$$|\Delta| < 1.55 \lambda$$

where Δ is a difference of a position of a center of gravity between spots of C and F lines on the surface of the light-receiving element and λ is a wavelength of the E line.

3. A focus detecting optical system according to claim 1, further satisfying the following condition:

$$3.50 \times 10^{-4} > |\delta d / D|$$

where δd is an image height error (mm) on a most peripheral side of a range measuring area and D is a distance (mm) between two images made by the pair of re-imaging lenses.

4. A focus detecting optical system according to claim 1, wherein a plurality of sets, each of which is a combination of the pair of aperture stops with the pair of re-imaging lenses corresponding thereto, so that, in each set, centers of the aperture stops and the re-imaging lenses corresponding thereto are decentered from an optical axis of the photographic lens and an amount of decentration varies with each set.

5. A focus detecting optical system according to claim 1, further comprising a light-receiving element having a light-receiving surface, and satisfying the following condition:

$$0.85 < LTL / fl < 1.75$$

where LTL is an optical path length (a length from the preset imaging plane to the light-receiving surface) of the focus detecting optical system and fl is a focal length of an entire focus detecting optical system.

6. A focus detecting optical system according to claim 1, wherein the re-imaging lenses are placed so that an optical axis of each of the re-imaging lenses is decentered farther away from a center of each of the aperture stops with respect to the optical axis of the photographic lens.

7. A camera comprising:
a focus detecting optical system;

a finder optical system;

a photographic lens;

5 path splitting means splitting an optical path from the photographic lens to direct the optical path toward an image sensor or a film and toward the finder optical system; and

a reflecting means conducting the optical path of the photographic lens to the focus detecting optical system,

10 the focus detecting optical system detecting a focus position of a photographing optical system from a positional relationship between at least one pair of secondary object images, wherein the focus detecting optical system comprises:

a condenser lens placed in the proximity of a preset imaging plane equivalent to an imaging plane of a photographic lens;

15 a pair of aperture stops dividing a pupil of the photographic lens placed on an exit side of the condenser lens into two areas; and

a pair of re-imaging lenses for forming two secondary object images corresponding to the aperture stops,

and satisfies the following conditions:

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$$0.45 < |mg| < 0.75$$

$$0.75 < |R1 / R2| < 1.25$$

$$|R3 / R4| \leq 0.02$$

25 where mg is an imaging magnification of the focus detecting optical system, R1 is a radius of curvature of an entrance surface of the condenser lens, R2 is a radius of curvature of an exit surface of the condenser lens, R3 is a radius of curvature of an entrance surface of each of the re-imaging lenses, and R4 is a radius of curvature of an exit surface of each of the re-imaging lenses.

8. A camera according to claim 7, wherein a diameter of an image circle of the camera is substantially a half of the diameter of the image circle of a 135 format

camera.

9. A camera according to claim 7, further comprising the image sensor placed on the optical path of the photographic lens.

10. A camera comprising:

an image sensor provided with a light-receiving surface receiving light from a photographing optical system; and

a focus detecting optical system detecting a focus position of the photographing optical system from a positional relationship between at least one pair of secondary image objects with light from the photographing optical system,

wherein a diameter of an image circle of the camera is substantially a half of the diameter of the image circle of a 135 format camera.

11. A camera according to claim 10, wherein the focus detecting optical system satisfies the following condition:

$$0.45 < |mg| < 0.75$$

where mg is an imaging magnification of the focus detecting optical system.

12. A camera according to claim 10, further comprising a reflecting mirror reflecting the light from the photographing optical system to conduct the light to the focus detecting optical system.

13. A camera according to claim 12, wherein the reflecting mirror is moved to conduct the light from the photographing optical system to the image sensor.